

Van Allen Probes 衛星を用いた磁気音波波動の統計解析 Statistical analysis of magnetosonic waves from the Van Allen Probes data

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Magnetosonic waves (MSWs) are X mode electromagnetic emissions seen at between the proton cyclotron frequency and the lower hybrid resonant frequency. Their magnetic field fluctuations have a linear polarization. It has been suggested that MSWs can contribute to the acceleration of relativistic electrons in the radiation belts. In this study, we statistically investigate plasmaspheric MSWs using data from the EMFISIS instrument onboard the Van Allen Probes. The MSWs occur at all local times but in this study we observe them mainly on the dayside and during both magnetically quiet and active periods. We also investigate the polarization of MSWs using the spectral matrix. At $L < 1.5$, the polarization of at the lower frequency component of MSWs changes from R-mode to X-mode. At the same location, there are some L-mode waves that may be converted from the R-mode waves below the cross-over frequency. These L-mode waves may contribute to the plasmaspheric EMIC waves deep in the plasmasphere.

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